

November 20, 2004

REnex Technology Limited
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Dear Mr. Cheong Lik Ming:

Enclosed you will find your file copy of a Part 15 Certification (FCC ID: QNT-PT209-0104003).

For your reference, TCB will normally take another 15 to 20 days for reviewing the report. Approval will then be granted when no query is sorted.

Please contact me if you have any questions regarding the enclosed material.

Sincerely,

A handwritten signature in black ink, appearing to read 'Tommy Leung', with a large, sweeping initial stroke.

Tommy Leung
Supervisor

Enclosure

FCC ID: QNT-PT209-0104003

REnex Technology Limited

Application
For
Certification

2.4GHz Single Channel Direct Sequence Spread Spectrum Wireless
Modem with RS232 Port, USB Port and LAN Port

(FCC ID: QNT-PT209-0104003)

04098225
TL/Ann Choy
November 20, 2004

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed a refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

FCC ID: QNT-PT209-0104003

Intertek Testing Services Hong Kong Ltd.

2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong.
Tel: (852) 2173 8888 Fax: (852) 2741 1693 Website: www.hk.intertek-etlsemko.com

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INTERTEK TESTING SERVICES

MEASUREMENT/TECHNICAL REPORT

REnex Technology Limited- MODEL: Purpletooth PT-209G
FCC ID: QNT-PT209-0104003

This report concerns (check one) Original Grant ☒ Class II Change ☐

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter and Class B
Personal Computer Peripheral

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until : _____
dae

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be
issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [12-
08-03 Edition] provision.

Report prepared by:

Tommy Leung
Intertek Testing Services
2/F., Garment Centre,
576 Castle Peak Road,
Kowloon, Hong Kong.
Phone: 852-2173-8538
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INTERTEK TESTING SERVICES

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INTERTEK TESTING SERVICES

List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	config photos.doc
Test Report	6 dB Bandwidth Plot	w6dB.pdf
Test Report	Maximum Power Density Reading	wpowden.pdf
Test Report	Out Band Antenna Conducted Emission Plot	wobantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	wdcc.pdf
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
User Manual	FCC Information	FCC information.pdf
RF Exposure Info	RF Safety	RF exposure info.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

INTERTEK TESTING SERVICES

1.0 Summary of Test

REnex Technology Limited- MODEL: Purpletooth PT-209G
FCC ID: QNT-PT209-0104003

TEST	REFERENCE	RESULTS
Max. Output Power	15.247(b)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(d)	Pass
Out of Band Antenna Conducted Emission	15.247(c)	Pass
Radiated Emission in Restricted Bands	15.247(c)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an antenna that is connected to the modem PCB via a standard SMA connector. However, the connector part is hidden by the front panel of the modem and can not be disconnected by user. Hence, the antenna is an integral which, in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

EXHIBIT 2
GENERAL DESCRIPTION

INTERTEK TESTING SERVICES

2.0 **General Description**

2.1 Product Description

The model Purpletooth PT-209G is a 2.4Ghz Spread Spectrum Wireless Modem. It operates at frequency of 2447.6MHz and is designed to provide a long distance, high data rate and robust platform for applications. It offers data communication capabilities to application equipment via a standard RS232 interface, USB Interface or LAN Interface. Neither additional hardware nor software modification is required in the application equipment to work with PT-209G. By using a pair of PT-209G modems, users can transfer data between almost any types of equipment that use asynchronous serial interfaces, USB Interfaces or LAN Interfaces. The small size and superior performance of PT-209G make it an ideal solution for many applications. Typical examples are:

- Traffic Control
- Remote Monitoring
- Telemetry
- Remote Camera/ Robot Control
- Mobile Video Transmission
- Environmental Monitoring
- Emergency Rescue
- Premises Security
- Logistics

The antenna is a dipole antenna (Model: RO-IK-0504 from Radiall) with 1.5dBi antenna gain and is connected to the modem PCB via a standard SMA connector. However, the connector part is hidden by the front panel of the modem and can not be disconnected by user. Hence, the antenna is an integral. The test sample is a prototype.

The circuit description is saved with filename: descri.pdf

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2.2 Related Submittal(s) Grants

This is an application for Certification of a DSS-Part 15 Spread Spectrum Transmitter and a Class B Personal Computer Peripheral.

There are two antenna options in PT-209G package.

- 1) Dipole antenna, model:RO-IK-0504 from Radiall
- 2) Magnetic mount antenna, model: TQC-2400AIP from Kenbotong

They have FCC ID: QNT-PT209-0104001 and FCC ID: QNT-PT-209-0104002 respectively.

They have been filed at the same time.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, three interface output ports of EUT (RS232, USB and RJ-45) were connected to correspondence interface input ports of personal computer. All cables were manipulated to produce worst case emissions. The EUT was powered by an AC adaptor. Three data communication (RS232, USB and RJ-45) modes were examined. The maximum channel data rate and baseband modulation were selected 1Mbps and QPSK respectively to produce worst case emissions.

The signal is maximized through rotation and placement in the three orthogonal axes if necessary. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1MHz or greater for frequencies above 1000MHz. All emissions greater than 20 dB below the permissible value is not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9kHz to 25GHz.

3.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

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3.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC Adaptor was used to power the device. Its description is listed below.

- (1) AC adapter Input: 110-240Vac 50-60Hz 0.8A, Output: 12Vdc 2A, Model No.: CP26A0120V2000. (Supplied by Client)

CABLES:

- (1) 1 x RS232 DB9 1 meter serial shielded cable with ferrite (Supplied by Client)
- (2) 1 x USB cable with 2 meters
- (3) 1 x crossover LAN cable with 1 meter

OTHERS:

For Radiated Emission Test:

- (1) HP Computer, Model: D530S, S/N: CNG4110DX, DOC Product
- (2) Philips LCD Monitor, Model 150B4CG, S/N: CX000409301774, DOC Product
- (3) HP Keyboard, Model: KB-0133, S/N: B55940EGANR0CE, DOC Product
- (4) HP Mouse, Model: M-S69, FCC ID: JNZ211443
- (5) HP Printer, Model: C2642A, S/N: SG67B131RY, FCCID: B94C2642X

For Conducted Emission Test:

- (6) HP Computer, Model Vectra VL420, S/N: SG20409996, DOC Product
- (7) HP Monitor, Model D2813, S/N: TW63600424, FCCID: A3KM043
- (8) HP Keyboard, Model: SK-2502, S/N: C0205303122, FCCID: GYUR41SK
- (9) HP Mouse, Model: M-S48A, FCCID: JNZ201213
- (10) HP Printer, Model: C2642A, S/N: SG67B131RY, FCCID: B94C2642X

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3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

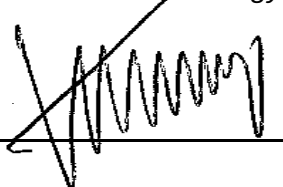
Any modifications installed previous to testing by REnex Technology Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 3.0 of this report are confirmed by:

Confirmed by:

*Tommy Leung
Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for REnex Technology Limited*



Signature

20 November, 2004 Date

EXHIBIT 4
MEASUREMENT RESULTS

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) :

- ☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.
- ☐ The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW>20dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyser.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6) dBm.

(Wireless Modem) Max. Antenna Gain = 10 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
2447.6	20.3	107.2

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: ☐ included in OFFSET function
☐ added to SA raw reading

Limit: 1W

dBm max. output level = 20.3 dBm (26 dBm or less)

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.2 Maximum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

(Wireless Modem)	
Frequency (MHz)	Min. 6 dB Bandwidth (kHz)
2477.6	18,240

Refer to the following plots for 6 dB bandwidth sharp:

Plot W2a: Low Channel 6 dB RF Bandwidth

Limit: at least 500kHz

For electronic filing, the above plots are saved with filename: w6dB.pdf

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.3 Maximum Power Density Reading, FCC Rule 15.247(d):

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

$$\text{SWEEP TIME (SEC)} = (\text{Fstop, kHz} - \text{Fstart, kHz}) / 3 \text{ kHz}$$

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator or and/ or cable as used, these losses are compensated for with the analyzer OFFSET function.

Frequency (MHz)	Power Density (dBm)
2445.042	1.92

Frequency Span = 2.4 MHz

Sweep Time = Frequency Span/ 3 kHz = 800 seconds

Cable Loss: 0.5 dB

Refer to the following plots for power density:

Plot W3a.1-W3a.8: for Power Density

Limit: 8dBm

For electronic filing, the above plots are saved with filename: wpowden.pdf

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(c):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Plot W4a.1-W4a.2 for Out of Band Conducted Emission*
Plot W4b.1-W4b.2 for Modulation Products Emission*

The plots showed the 2nd harmonic and modulation products at the band edges of 2400.0 MHz and 2483.5 MHz. In addition, all spurious emission and up to the tenth harmonic was measured and they were found to be at least 26 dB below the highest level of the desired power in the passband.

For electronic filing, the above plots are saved with filenames: wobantcon.pdf

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 26 dB below carrier), FCC Rule 15.247(c):

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

The EUT was placed on a non-conductive turntable at a height of approximately 1 meter above the ground plane of a 3 meter open test site. For each frequency investigated, the turntable was rotated 360 degrees, and the search antenna was raised and lowered in both horizontal and vertical polarizations, in an attempt to maximize the signal. The maximum level was recorded, along with the search antenna polarity (Vertical or Horizontal).

☒ Not required

☐ See attached data sheet

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Example

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

$$\text{Level in mV/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.8 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
336.000 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.9 Radiated Emission Data - Transmitter

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 0.9 dB margin

TEST PERSONNEL:



Tester Signature

Ken Sit, Lead Engineer
Typed/Printed Name

November 20, 2004
Date

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G
Mode : TX

Date of Test: June 2-October 20, 2004

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dB μ V/m)	Average Factor (-dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	**2444.430	113.5	34	29.1	108.6	17.6	91.0	---	---
V	*4888.860	42.4	34	34.0	42.4	17.6	24.8	54.0	-29.2
V	*7333.290	39.7	34	37.0	42.7	17.6	25.1	54.0	-28.9
V	9777.720	38.6	34	39.2	43.8	17.6	26.2	54.0	-27.8
V	*12222.150	37.4	34	40.2	43.6	17.6	26.0	54.0	-28.0

Result: **Fundamental emission was measured for determining bandedge compliance of using delta measurement technique. The calculated worst case field strength at 2483.5MHz is 43.8dB μ V/m and is passed by 10.2dB margin which in compliance with part 15.205.

NOTES: 1. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna and peak detector are used for the emission over 1000MHz.

*Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.10 Radiated Emissions from Digital Section of Transceiver (Transmitter) and Class B Personal Computer Peripheral, FCC Ref: 15.109

- ☐ Not required - No digital part
- ☒ Test results are attached
- ☐ Included in the separated DOC report.

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G
Mode: USB Communication

Date of Test: June 2-October 20, 2004

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit (dBμV/m)	Margin (dB)
V	48.000	40.4	16	11.9	36.3	40.0	-3.7
V	52.000	34.4	16	11.7	30.1	40.0	-9.9
H	116.103	45.3	16	12.8	42.1	43.5	-1.4
H	192.000	39.2	16	17.1	40.3	43.5	-3.2
V	215.993	42.2	16	11.8	38.0	43.5	-5.5
H	240.000	45.9	16	11.4	41.3	46.0	-4.7
V	287.992	40.7	16	13.3	38.0	46.0	-8.0
H	319.987	40.0	16	14.3	38.3	46.0	-7.7
H	336.000	46.5	16	14.6	45.1	46.0	-0.9
H	340.000	37.2	16	14.6	35.8	46.0	-10.2
H	359.996	41.1	16	14.9	40.0	46.0	-6.0
H	384.000	44.0	16	15.4	43.4	46.0	-2.6
H	408.017	40.2	16	15.9	40.1	46.0	-5.9

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.

Test Engineer: Ken Sit

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.11 AC Line Conducted Emission, FCC Rule 15.207:

☐ Not required

☒ Test data attached

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.12 Line Conducted Configuration Photograph

Worst Case Line-Conducted Configuration

at 7.885 MHz

For electronic filing, the worst case line conducted configuration photographs are saved with filename: config photos.doc

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.13 Line Conducted Emission Data

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by 16.7 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Ken Sit, Lead Engineer
Typed/Printed Name

November 20, 2004
Date

INTERTEK TESTING SERVICES

Company: REnex Technology Limited
Model: Purpletooth PT-209G

Date of Test: June 2-October 20, 2004

4.14 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Wireless Modem:

Duty cycle (DC) = Maximum ON time in 22.70ms/22.70ms
= 3.00ms/22.70ms
= 0.132

Duty cycle correction, dB = $20 \times \log(\text{DC})$
= $20 \times \log(0.132)$
= -17.58 dB

X	See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot W5a.1-2
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filenames: wdcc.pdf

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc, internal photos.doc.

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8
INSTRUCTION MANUAL

8.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filenames: manual.pdf

Please note that the required FCC Information to the User is saved with filename: FCC information.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

For RF safety, the information is saved with filename: RF exposure info.pdf.